REMARKS

The Office Action dated September 4, 2008 has been received and its contents carefully noted. From the Summary page, claims 1-6 were pending and indicated as rejected. The Drawings filed September 22, 2006 have been accepted. Acknowledgment has been made of Applicants' Claim for Foreign Priority. The Information Disclosure Statements filed September 22, 2006, December 6, 2006, January 12, 2007 and January 31, 2008 have been considered.

By this Response, claims 1, 4 and 6 have been amended and claim 2 has been canceled. Specifically, claims 1 and 6, as amended, recite front and rear seats, **34** and **35**, on a lower surface of the substrate support device **20**, each with inclined surfaces **34a** and **35a**, respectively. The fixed engagement member **30** and movable engagement member **31** now are described as having inclined surfaces **30a** and **31a**, respectively. Also the claim amendments clarify that the movable engagement member **31** moves towards the fixed engagement member **30** in order to grip the process object (i.e., wafer) supported by the inclined surfaces **34a**, **35a**, **30a** and **31a** so as to form a gap between the substrate support device and an upper surface of the process object.

Applicants have amended paragraph [0031] of the Specification so as to include reference designations for specific features illustrated in the Drawings, particularly FIGs. 8-9. Further, FIGs. 8 and 9 have been amended to designate the same features, namely inclined surfaces of the front and rear sets, with reference designations **34a** and **35a**, respectively. No statutory new matter has been added. All amendments are supported by the originally filed disclosure.

Accompanying the response is a Petition for a 2-month Extension of Time and the requisite fee.

Claim Objections

An objection was made to claim 4 because "device" should have been pluralized. In response, Applicants have amended claim 4 so as to recite "devices". Accordingly, Applicants earnestly solicit withdrawal and reconsideration of the claim objection.

Claim Rejections – 35 U.S.C. § 103(a)

I. Claims 1-3 and 6 stand rejected as being unpatentable over Tometsuka (US 2001/0052325) in view of Lee et al. (US 5,810,935). The rejection as to claim 2 is moot due to claim cancelation. The rejection as to claims 1, 3 and 6 is traversed.

A. Claim 1, as amended, recites a vertical heat treatment system comprising:

"a heat treatment furnace...;

a lid...;

a holder...;

an elevating mechanism...; and

a transfer mechanism that transfers process objects between the holder and a container holding therein a plurality of process objects at intervals, the transfer mechanism including:

a plurality of substrate support devices spaced at intervals, each substrate support device having front and rear seats fixedly provided on a lower surface of the substrate support device for respectively receiving front and rear edge portions of an upper surface of a process object, the front seat having an inclined surface directed obliquely downward and the rear seat having an inclined surface directed obliquely downward; and

gripping mechanisms, each gripping mechanism being configured to grip a process object on an under side of an associated one of the substrate support devices, each of the gripping mechanisms having a fixed engagement member fixedly provided on a distal end of its associated substrate support device to engage with a front edge portion of a process object, and a movable engagement member movably attached to a proximal end of its associated substrate support device to be disengageably engaged with a rear edge portion of the process object, the fixed engagement member having an inclined surface directed obliquely upward to support a front edge portion of a lower surface of the process object, and the movable engagement member having an inclined surface directed obliquely upward to support a rear edge portion of the lower surface of the process object,

whereby when the movable engagement member moves forward relative to its associated substrate support device to approach the fixed engagement member and grip the process object, the front edge portion of the process object is held by the inclined surface of the

front seat and the inclined surface of the fixed engagement member, while the rear edge portion of the process object is held by the inclined surface of the rear seat and the inclined surface of the movable engagement member, so that a gap is formed between a lower surface of the substrate support device and an upper surface of the process object."

Applicants respectfully submit that the combination of Tometsuka and Lee fail to teach or suggest all of the features of the present invention, and thus, amended claim 1 patentably distinguishes thereover.

1. As an initial matter, Applicants submit that Tometsuka's members 54 and 55 do not disclose Applicants' recited fixed and movable engagement members, respectively. A fair reading of Tometsuka establishes element 54 as a mounting block and element 55 as tweezers. See pg. 3, para. 52 and FIG. 1. The tweezers are horizontally mounted onto the block. Id. The Office Action on pg. 4 also asserts element 55 to be a substrate support device.

To ensure understanding, reference is made to FIG. 11 where Applicants show that substrate support device **20** has, on an underside, a fixed engagement member **30** located at a distal end, and a movable engagement member **31** located at a proximal end. A space is provided between the engagement members in order to grip front and rear edges of a process object (i.e., wafer). Since the wafer is gripped on the edges by the engagement members, the upper surface of the wafer is prevented from being rubbed and damaged by the lower surface of the substrate support device. See para. [0037]. It is clear that Tometsuka alone fails to disclose equivalents to Applicants' claimed engagement member structure.

The asserted combination of Tometsuka and Lee likewise would not have rendered amended claim 1 prima facie obvious to one of ordinary skill in the art. First, the Office Action admits that Tometsuka fails to teach a gripping mechanism configured to grip a process object on an under side of a respective one of the substrate support devices, *i.e.*, on the top side of the process object. The Office Action thus relies on Lee.

However, a study of Lee's invention in view of FIG. 1b indicates that support pad 102 and forefingers 110 are provided to hold a wafer at outer underside portions of the wafer. See col. 3, ll. 5-40. The forefingers 110 have two arms that open and close via an actuating means. Id.

In Applicants' structure, by contrast, movable engagement member **31** contacts the wafer on a proximal end and the fixed engagement member **30** contacts the wafer on a distal end. Applicants' FIG. 11(b) illustrates placement of the wafer onto a plate **15** whereby only the fixed engagement member **30** contacts a peripheral edge of the wafer. That is, the movable engagement member moves away from the peripheral edge of the wafer relative to the substrate support device **20**. Lee wholly fails to suggest "*when the movable engagement member moves forward relative to its associated substrate support device to approach the fixed engagement member and grip the process object*". Thus, the asserted combination of Tometsuka and Lee would not have rendered Applicants' arrangement prima facie obvious to one of ordinary skill in the art.

2. Further, Applicants submit that Tometsuka and Lee fail to teach inclined surfaces for front and rear substrate support devices as well as inclined surfaces for fixed and movable engagement members. The Office Action relies upon Lee's semicircular groove 121 as illustrated in FIG. 3(a-b) located in contact pad 120.

In this regard, particular reference is made to Applicants' inclined surface **31a** of the movable engagement member **31** in relation to the inclined surface **35a** of the rear seat **35**. See FIGs. 8-10. The movable engagement member moves relative to the substrate holding device **20** upon which the rear seat **35** is fixedly provided. On the other hand, Lee's semicircular groove 121 fails to suggest the above-mentioned features of Applicants' invention because the forefingers 110 have two arms that move relative to one another in order to grip a wafer. That is, Lee fails to teach "*whereby when the movable engagement member moves forward relative to its associated substrate support device to approach the fixed engagement member and grip the process object, the front edge portion of the process object is held by the inclined surface of the front seat and the inclined surface of the fixed engagement member, while the rear edge portion of the process object is held by the inclined surface of the rear seat and the inclined surface of the movable engagement member, so that a gap is formed between a lower surface of the associated substrate support device and an upper surface of the process object*", and thus, claim 1 further patentably distinguishes thereover. In view of the foregoing, Applicants

earnestly solicit withdrawal and reconsideration of the rejection as to claim 1, and claim 3 dependent thereon.

B. Regarding claim 3, Applicants also submit that Tometsuka's cutouts 25 are not equivalents of Applicants' claimed feature. A fair reading of Tometsuka suggests that reference numeral 25 is a substrate holding groove formed in a column-shaped holding member 24 for holding wafers. See Fig. 1 and para. [0045]. On the other hand, Applicants' cutouts 36 and 37 are formed on the ring-shaped support plates 15 as exemplified in FIG. 5. Specifically, when the outer diameter of the ring-shaped support member 15 is larger than the wafer, cutouts are formed to prevent the ring-shaped support plate from colliding with the fixed (30) and movable (31) engagement members, and seats 35. In view of the structural and functional distinctions, Applicants' claimed cutouts patentably distinguish thereover. Accordingly, Applicants respectfully request withdrawal and reconsideration of the rejection as to claim 3.

C. Regarding claim 6, Applicants advance similar arguments on the merits as provided for claim 1. Specifically, Applicants urge that the asserted references fail to teach or suggest "*moving the movable engagement member forward relative to its associated substrate support device to approach the fixed engagement member to grip the process object, so that the front edge portion of the process object is held by the inclined surface of the front seat and the inclined surface of the fixed engagement member, while the rear edge portion of the process object is held by the inclined surface of the rear seat and the inclined surface of the movable engagement member, so that a gap is formed between a lower surface of the associated substrate support device and an upper surface of the process object*". In effect, the present invention is an improvement upon the prior art by permitting only one movable engagement member (while the other engagement member remains fixed) for moving a wafer to a processing station with a gap between such wafer and a substrate support device. As a result of Applicants' claimed structure, the thickness of each substrate support device can be reduced. This, in turn, allows more wafers to be handled in the resulting processing system. Accordingly, throughput is increased. In view of the foregoing, Applicants also courteously request withdrawal and reconsideration of the rejection as to claim 6.

II. Claim 4 stands rejected as being unpatentable over Tometsuka (US 2001/0052325) in view of Lee et al. (US 5,810,935) as applied to claim 1, and further in view Ohsawa et al. (US 5,813,819). The rejection as to claim 4 is traversed.

Applicants submit that Ohsawa does not remedy the deficiencies of Tometsuka and Lee with respect to claim 1. Thus, Applicants advance similar arguments presented for claim 1 herewith. Accordingly, withdrawal and reconsideration of the rejection as to claim 4 are courteously solicited.

III. Claim 5 stands rejected as being unpatentable over Tometsuka (US 2001/0052325) in view of Lee et al. (US 5,810,935) as applied to claim 1, and further in view Suzuki et al. (US 6,758,876). The rejection as to claim 5 likewise is traversed.

Applicants urge that also Suzuki does not remedy the deficiencies of Tometsuka and Lee with respect to claim 1. Thus, again, Applicants advance similar arguments presented for claim 1 herewith. Withdrawal and reconsideration of the rejection as to claim 5 similarly are solicited.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Therefore it is respectfully requested that the Examiner reconsider all presently outstanding objection and rejection and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, in the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. 1.136(a), and any fees required therefore are hereby authorized to be charged to Deposit Account No. 02-4300, Attorney Docket No. 33082M355.

Respectfully submitted,

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